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Osha Liang LLP/Synaptics 909 Fannin Street, Suite 3500 Houston, TX 77010			LAM, VINH TANG	
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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte TOM VANDERMEIJDEN

Appeal 2016-007651
Application 14/041,531¹
Technology Center 2600

Before ST. JOHN COURTENAY III, CATHERINE SHIANG, and
JOHN D. HAMANN, *Administrative Patent Judges*.

HAMANN, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellant files this appeal under 35 U.S.C. § 134(a) from the Examiner's Final Rejection of claims 1–29. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

THE CLAIMED INVENTION

Appellant's claimed invention relates to determining absolute capacitive images, transcapacitive images, and hybrid capacitive images based on information obtained from a plurality of sensor electrodes. *See*

¹ According to Appellant, the real party in interest is Synaptics Incorporated. App. Br. 1.

Abstract. Claim 1 is illustrative of the subject matter of the appeal and is reproduced below.

1. A method of determining a hybrid capacitive image comprising:
 acquiring a transcapacitive image, a first absolute capacitive profile, and a second absolute capacitive profile with a plurality of sensor electrodes;
 determining an absolute capacitive image as a function of said first absolute capacitive profile and said second absolute capacitive profile; and
 determining a hybrid capacitive image as a function of said absolute capacitive image and said transcapacitive image.

REJECTIONS ON APPEAL

(1) The Examiner rejected claims 1, 3, 6, 9, 10, 13, 16, 19–21, and 24–27 under 35 U.S.C. § 103(a) as being unpatentable over Grivna et al. (US 2011/0025629 A1; published Feb. 3, 2011) (hereinafter “Grivna”).

(2) The Examiner rejected claims 2, 12, 23, and 29 under 35 U.S.C. § 103(a) as being unpatentable over the combination of Grivna and Sobel et al. (US 2013/0176271 A1; published July 11, 2013) (hereinafter “Sobel”).

(3) The Examiner rejected claims 4, 7, 14, and 17 under 35 U.S.C. § 103(a) as being unpatentable over the combination of Grivna and Wu et al. (US 2013/0257797 A1; published Oct. 3, 2013) (hereinafter “Wu”).

(4) The Examiner rejected claims 5, 8, 15, and 18 under 35 U.S.C. § 103(a) as being unpatentable over the combination of Grivna and Mohindra (US 2014/0327644 A1; published Nov. 6, 2014).

(5) The Examiner rejected claims 11, 22, and 28 under 35 U.S.C. § 103(a) as being unpatentable over the combination of Grivna and Levesque et al. (US 2015/0009168 A1; published Jan. 8, 2015) (hereinafter “Levesque”).

ANALYSIS

We have reviewed the Examiner's rejections in light of Appellant's contentions that the Examiner erred. In reaching our decision, we consider all evidence presented and all arguments made by Appellant.

We disagree with Appellant's arguments and we incorporate herein and adopt as our own the findings, conclusions, and reasons set forth by the Examiner in (1) the July 15, 2015 Final Office Action ("Final Act." 2–20) and (2) the June 8, 2016 Examiner's Answer ("Ans." 2–20). We highlight and address, however, specific findings and arguments below for emphasis.

(1) *Absolute capacitive image*

Appellant argues Grivna fails to teach or suggest "determining an absolute capacitive image as a function of said first absolute capacitive profile and said second absolute capacitive profile," as recited in claim 1. App. Br. 7–8; Reply Br. 2–3. "Absolute capacitance" is synonymous with "self capacitance" (Spec. ¶ 26), and both the Examiner and Appellant agree that the term refers to "the capacitive coupling between [a] sensor electrode[] and an input object." See Reply Br. 2; Ans. 3; see also Grivna ¶ 49 (describing self capacitance as being capacitance "between the sensor element and a reference node such as ground"). An "absolute capacitance profile" comprises measurements of absolute capacitance of sensors that are arrayed along an axis. Spec. ¶ 41. Appellant argues Grivna teaches "X and Y capacitive profiles," but is silent concerning (i) absolute capacitive images, as well as (ii) determining absolute capacitive images **as a function of** absolute capacitive profiles. App. Br. 8 (citing Grivna ¶¶ 59, 64).

The Examiner finds Grivna teaches or suggests the disputed limitation. Ans. 3–6. The Examiner finds an "*absolute capacitive image*" is

defined in the Specification as being “[a] set of measurements from the capacitive pixels [that is] . . . representative of the capacitive couplings at the pixels.” Ans. 4 (citing Spec. ¶ 40). The Examiner finds Grivna, thus, teaches or suggests determining an absolute capacitive image by measuring values (i.e., a set of measurements) of self capacitance of pixels. *See* Ans. 4–5 (quoting Grivna ¶ 49 (reciting, in part, “controller 330 is capable of measuring . . . self capacitances of sensor elements (between the sensor element and a reference node such as ground)”); citing Grivna Fig. 3B).

The Examiner also finds Grivna teaches determining the absolute capacitive image as a function of absolute capacitive profiles. *See* Ans. 5–6. More specifically, the Examiner finds Grivna teaches or suggests measuring the self capacitance of each sensor in a sequence (i.e., a profile, such as a column of sensors or a row of sensors) for a sensor array (e.g., N rows by M columns). *Id.* (citing Grivna ¶ 57; Fig. 3B). Grivna’s Figure 3B, shown below, illustrates two examples of these profiles (i.e., X axis histogram 360, Y axis histogram 340). *See* Ans. 5–6 (citing Grivna Fig. 3B; ¶¶ 49, 59, 64).

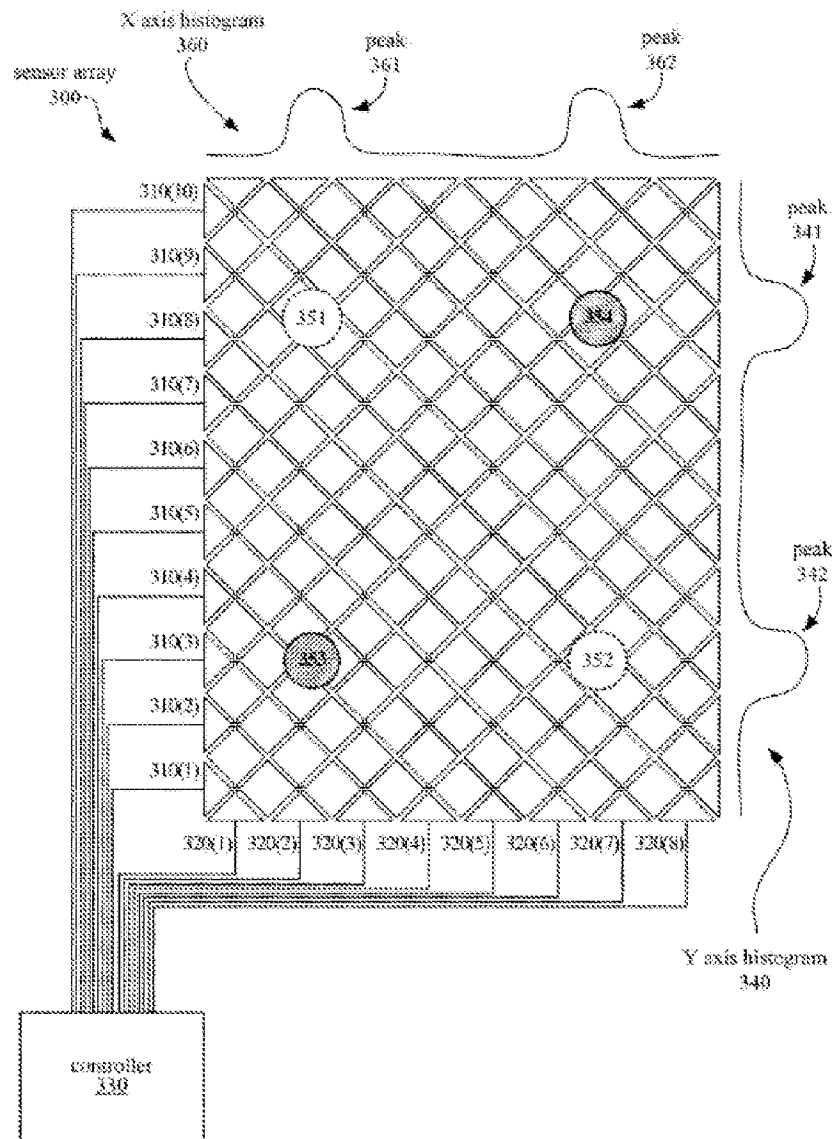


FIGURE 3B

Figure 3B of Grivna illustrates “a touchscreen controller and sensor array.” Grivna ¶ 9. The Examiner finds Grivna teaches or suggests an absolute capacitance image (i.e., a set of measurements at 351–354, which correspond to the intersection of the peaks of the profiles, and are caused by contacts on the touchscreen) that is a function of self capacitance measurements of the X axis profile 360 (which has two peaks 361 and 362)

and the Y axis profile 340 (which has two peaks 341 and 342). *See* Ans. 5–6 (citing Grivna Fig. 3B; ¶¶ 49, 59, 64).

We agree with the Examiner’s findings and adopt them as our own. For example, we agree Grivna teaches determining an absolute capacitive image (e.g., measurements at 351–354) as a function of the first absolute capacitive profile (X axis histogram) and the second absolute capacitive profile (Y axis histogram). *See* Grivna Fig. 3B; ¶¶ 49, 59, 64.

Our above reasoning and findings are also applicable to these same arguments Appellant sets forth for claims 9, 20, and 26.

(2) Hybrid capacitive image

Appellant argues Grivna fails to teach or suggest “determining a hybrid capacitive image as a function of said absolute capacitive image and said transcapacitive image,” as recited in claim 1. App. Br. 8–9; Reply Br. 2–3. “Transcapacitance” is synonymous with “mutual capacitance” and refers to “the capacitive coupling between sensor electrodes.” *See* Spec. ¶ 27; Reply Br. 2; Ans. 3; *see also* Grivna ¶ 49. Appellant argues Grivna instead teaches “mutual capacitive sensing at selected locations where a possible touch has been indicated by a histogram (e.g., the X/Y profile sensing illustrated in Figure 3B).” App. Br. 8. Appellant contends Grivna is “silent with respect to . . . a hybrid capacitive image” and “never utilizes a transcapacitive image or transcapacitive measurement in any sort of a function.” Ans. 8–9.

The Examiner finds, and we agree, Grivna teaches or suggests the disputed limitation. Ans. 6–11, 13. We also agree with the Examiner that “transcapacitive image” refers to “measured values of mutual capacitances’ locations” (Ans. 6–7 (citing Spec. ¶ 62; Grivna ¶ 49, Fig. 3B)), and that

Grivna teaches or suggests transcapacitive images. Ans. 10–11 (citing Grivna ¶ 49 (teaching controller 330 can measure mutual capacitances between sensors, including “all or a portion of the intersections of sensor elements in the sensor array”), Fig. 3B).

The Examiner finds, and we agree, in accordance with the claim language, that a hybrid capacitive image is based on an absolute capacitive image and a transcapacitive image. *See* Ans. 8–11. We agree with the Examiner that Grivna teaches or suggests determining a hybrid capacitive image (i.e., measurements at actual contact locations 353, 354) based on the absolute capacitive image measurements (i.e., measurements at 351–354) and the transcapacitive image measurements (i.e., measurements at the corresponding intersections (e.g., 320(2) and 310(3); 320(2) and 310(8); 320(7) and 310(3); 320(7) and 310(8))). *See* Ans. 8–11 (citing Grivna Fig. 3B; ¶¶ 49 (teaching that controller 330 may, after detecting a presence of a contact using a self capacitance sense method, “switch to a mutual capacitance sense method to perform a scan in tracking mode of all or a portion of the intersections of sensor elements in the sensor array 300 to resolve the actual location of one or more contacts”), 57, 59, 64, 66).

Accordingly, on this record, and based upon a preponderance of the evidence, Appellant has not persuaded us the Examiner erred regarding the first-stated rejection of representative claim 1. *See* 37 C.F.R. § 41.37(c)(1)(iv).

Our above reasoning and findings are also applicable to these same arguments Appellant sets forth for independent claims 9, 20, and 26, also rejected under the first-stated rejection. Grouped claims 9, 20, and 26 fall with claim 1.

CONCLUSION

Based on our findings and reasoning above, we sustain the Examiner's rejection of claims 1, 9, 20, and 26, as well as grouped claims 3, 6, 10, 13, 16, 19, 21, 24, 25, and 27, as Appellant does not provide separate arguments for their patentability. We also sustain the Examiner's (i) rejection of claims 2, 12, 23, and 29; (ii) rejection of claims 4, 7, 14, and 17; (iii) rejection of claims 5, 8, 15, and 18; and (iv) rejection of claims 11, 22, and 28, as Appellant does not provide separate arguments for their patentability. Regarding rejections 2–5, arguments not made are waived. *See* 37 C.F.R. § 41.37(c)(1)(iv).

DECISION

We affirm the Examiner's decision rejecting claims 1–29.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED